WHAT IS CLAIMED IS:

1. A waterproof electrical connector, comprising:

a base housing having a plurality of terminal chambers and an internal space defined by a perimeter wall located behind the plurality of terminal chambers;

a rear cover configured to engage with the base housing to seal the internal space, the rear cover having a plurality of thru-holes;

a flexible plug that extends from an inner surface of the rear cover, the flexible plug being configured to be inserted into the internal space, and including ribs formed on an outer peripheral surface of the flexible plug;

the flexible plug having a plurality of thru-holes, the rear cover thru-holes and the flexible plug thru-holes being configured to concentrically align with the plurality of terminal chambers; and

the flexible plug having a channel formed on an inserting surface of the flexible plug, the channel being located between outermost flexible plug thru-holes and the outer peripheral surface of the flexible plug.

2. The waterproof electrical connector according to claim 1, wherein the channel is formed as a continuous loop.

3. The waterproof electrical connector according to claim 1, further comprising an inner housing that is installed within the internal space, the inner housing having a plurality of thru-holes that concentrically align with the plurality of terminal chambers, the plurality of flexible plug thru-holes and the plurality of rear cover thru-holes.

4. The waterproof electrical connector according to claim 3, further comprising a first engaging portion provided in at least one of the plurality of inner housing thru-holes, the first engaging portion being configured to engage with a second

engaging portion provided on a wire terminal attached to an end of an electrical wire when the wire terminal is inserted into the terminal chamber.

5. The waterproof electrical connector according to claim 1, wherein the flexible plug is made from a resilient elastomer and the rear cover is made from a hard synthetic resin, the flexible plug and the rear cover being integrated as a single piece by double-molding.

6. A waterproof electrical connector, comprising:

a base housing including a plurality of terminal chambers and an internal space defined by a perimeter wall located behind the plurality of terminal chambers;

a rear cover configured to engage with the base housing to seal the internal space, the rear cover having a plurality of thru-holes;

a flexible plug that extends from an inner surface of the rear cover, the flexible plug being configured to be inserted into the internal space, and including ribs formed on an outer peripheral surface of the flexible plug; and

the flexible plug having a plurality of thru-holes, the rear cover thru-holes and the flexible plug thru-holes being configured to concentrically align with the plurality of terminal chambers,

wherein each outermost thru-hole of the plurality of flexible plug thru-holes is axially curved outward toward an inserting end of the flexible plug.

7. A waterproof electrical connector, comprising:

a base housing including a plurality of terminal chambers and an internal space defined by a perimeter wall located behind the plurality of terminal chambers;

a rear cover configured to engage with the base housing to seal the internal space, the rear cover having a plurality of thru-holes;

a flexible plug that extends from an inner surface of the rear cover, the flexible plug being configured to be inserted into the internal space, and including ribs formed on an outer peripheral surface of the flexible plug; and

the flexible plug having a plurality of thru-holes, the rear cover thru-holes and the flexible plug thru-holes being configured to concentrically align with the plurality of terminal chambers,

wherein each outermost thru-hole of the plurality of rear cover thru-holes has a diameter larger than a diameter of interior thru-holes of the plurality of rear cover thru-holes, and

an inward wall portion of each outermost thru-hole of the plurality of flexible plug is inclined outward toward an inserting end of the flexible plug so that a diameter of the outermost flexible plug thru-hole decreases toward the inserting end, when the flexible plug is separated from the base housing.

8. A waterproof electrical connector comprising:

a base housing including a plurality of terminal chambers and an internal space defined by a perimeter wall located behind the plurality of terminal chambers;

a rear cover configured to engage with the base housing to seal the internal space, the rear cover having a plurality of thru-holes;

a flexible plug that extends from an inner surface of the rear cover, the flexible plug being configured to be inserted into the internal space, and including ribs that are formed on an outer peripheral surface of the flexible plug;

the flexible plug having a plurality of thru-holes, the rear cover thru-holes and the flexible plug thru-holes being configured to concentrically align with the plurality of terminal chambers; and

an outward wall portion of each outermost thru-hole of the plurality of flexible plug is inclined outward from an end connecting to the rear cover to an inserting end of the flexible plug so that a diameter of the outermost flexible plug thru-hole increases toward the inserting end, when the flexible plug is separated from the base housing.

9. The waterproof electrical connector according to claim 6, further comprising an inner housing that is installed within the internal space, the inner housing having a plurality of thru-holes that concentrically align with the plurality of terminal chambers, the plurality of flexible plug thru-holes and the plurality of rear cover thru-holes.

10. The waterproof electrical connector according to claim 7, further comprising an inner housing that is installed within the internal space, the inner housing having a plurality of thru-holes that concentrically align with the plurality of terminal chambers, the plurality of flexible plug thru-holes and the plurality of rear cover thru-holes.

11. The waterproof electrical connector according to claim 8, further comprising an inner housing that is installed within the internal space, the inner housing having a plurality of thru-holes that concentrically align with the plurality of terminal chambers, the plurality of flexible plug thru-holes and the plurality of rear cover thru-holes.

12. The waterproof electrical connector according to claim 9, further comprising a first engaging portion provided in at least one of the plurality of inner housing thru-holes, the first engaging portion being configured to engage with a second engaging portion provided on a wire terminal attached to an end of an electrical wire when the wire terminal is inserted into the terminal chamber.

13. The waterproof electrical connector according to claim 10, further comprising a first engaging portion provided in at least one of the plurality of inner housing thru-holes, the first engaging portion being configured to engage with a second

engaging portion provided on a wire terminal attached to an end of an electrical wire when the wire terminal is inserted into the terminal chamber.

14. The waterproof electrical connector according to claim 11, further comprising a first engaging portion provided in at least one of the plurality of inner housing thru-holes, the first engaging portion being configured to engage with a second engaging portion provided on a wire terminal attached to an end of an electrical wire when the wire terminal is inserted into the terminal chamber.

15. The waterproof electrical connector according to claim 6, wherein the flexible plug is made from a resilient elastomer and the rear cover is made from a hard synthetic resin, the flexible plug and the rear cover being integrated as a single piece by double-molding.

16. The waterproof electrical connector according to claim 7, wherein the flexible plug is made from a resilient elastomer and the rear cover is made from a hard synthetic resin, the flexible plug and the rear cover being integrated as a single piece by double-molding.

17. The waterproof electrical connector according to claim 8, wherein the flexible plug is made from a resilient elastomer and the rear cover is made from a hard synthetic resin, the flexible plug and the rear cover being integrated as a single piece by double-molding.

18. A waterproof electrical connector, comprising:

a base housing including a plurality of terminal chambers and an internal space defined by a perimeter wall located behind the plurality of terminal chambers;

an inner housing that is installed to a floor of the internal space in the base housing;

a rear cover configured to engage with the base housing to seal the internal space, the rear cover having a plurality of thru-holes;

a flexible plug that extends from an inner surface of the rear cover, the flexible plug being configured to be inserted into the internal space, and including ribs that are formed on an outer peripheral surface of the flexible plug;

the flexible plug having a plurality of thru-holes, the rear cover thru-holes and the flexible plug thru-holes being configured to concentrically align with the plurality of terminal chambers;

a distortion suppressing flange extending from a perimeter of an inserting surface of the flexible plug; and

a ledge formed in a perimeter wall of the inner housing, the ledge being configured to engage with the distortion suppressing flange.

19. The waterproof electrical connector according to claim 18, wherein the inner housing is previously fixed to the internal space in the base housing.

20. The waterproof electrical connector according to claim 18, wherein the inner housing is previously attached to an insertion side of the flexible plug, and is installed within the internal space in the base housing together with the flexible plug.

21. The waterproof electrical connector according to claim 18, wherein the distortion suppressing flange is formed as a continuous loop extending from the perimeter of the inserting surface of the flexible plug, and the ledge is formed as a continuous loop on an end of the inner housing.

22. The waterproof electrical connector according to claim 18, wherein the flexible plug is made from a resilient elastomer and the rear cover is made from a hard synthetic resin, the flexible plug and the rear cover being integrated as a single piece by double-molding.

23. A waterproof electrical connector, comprising:

a base housing having a plurality of terminal chambers and an internal space defined by a perimeter wall located behind the plurality of terminal chambers;

a rear cover configured to engage with the base housing to seal the internal space, the rear cover having a plurality of thru-holes;

a flexible plug that extends from an inner surface of the rear cover, the flexible plug being configured to be inserted into the internal space, and including ribs formed on an outer peripheral surface of the flexible plug; and

the flexible plug having a plurality of thru-holes, the rear cover thru-holes and the flexible plug thru-holes being configured to concentrically align with the plurality of terminal chambers;

wherein the flexible plug is configured such that upon insertion of the flexible plug within the base housing, the plurality of flexible plug thru-holes remain substantially concentrically aligned with the plurality of terminal chambers despite constrictive pressure applied by the perimeter wall to the flexible plug upon insertion.

24. The waterproof electrical connector according to claim 23, wherein the flexible plug has a channel formed on an inserting surface of the flexible plug, and the channel is located between outermost flexible plug thru-holes and the outer peripheral surface of the flexible plug so that the channel is closed upon insertion of the flexible plug within the base housing to absorb the constrictive pressure applied by the perimeter wall to the flexible plug upon insertion.

25. The waterproof electrical connector according to claim 23, wherein the each outermost thru-hole of the plurality of flexible plug thru-holes is axially curved outward toward the inserting end of the flexible plug, so that the each outermost thru-hole is deformed upon insertion of the flexible plug within the base housing to substantially

concentrically align the plurality of flexible plug thru-holes with the plurality of terminal chambers.

26. The waterproof electrical connector according to claim 23, wherein each outermost thru-hole of the plurality of rear cover thru-holes has a diameter larger than a diameter of interior thru-holes of the plurality of rear cover thru-holes, and

an inward wall portion of each outermost thru-hole of the plurality of flexible plug is inclined outward toward the inserting end of the flexible plug so that a diameter of the outermost flexible plug thru-hole decreases toward the inserting end when the flexible plug is separated from the base housing, and the inclined wall is deformed upon insertion of the flexible plug within the base housing to substantially concentrically align the plurality of flexible plug thru-holes with the plurality of terminal chambers.

27. A waterproof electrical connector according to claim 23, wherein an outward wall portion of each outermost thru-hole of the plurality of flexible plug is inclined outward toward the inserting end of the flexible plug so that a diameter of the outermost flexible plug thru-hole increases toward the inserting end when the flexible plug is separated from the base housing, and the inclined wall is deformed upon insertion of the flexible plug within the base housing to substantially concentrically align the plurality of flexible plug thru-holes with the plurality of terminal chambers.

28. The waterproof electrical connector according to claim 23, further comprising an inner housing that is installed to a floor of the internal space in the base housing, the inner housing including a plurality of thru-holes configured to be aligned with the plurality of terminal chambers and a ledge formed in a perimeter wall of the inner housing,

wherein the flexible plug includes a distortion suppressing flange extending from a perimeter of an inserting surface of the flexible plug, and engaging with the ledge, so that the plurality of flexible plug thru-holes remain substantially concentrically aligned with

the plurality of the inner housing thru-holes despite the constrictive pressure applied by the perimeter wall to the flexible plug upon insertion.